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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,112	05/09/2001	Stanley P. Woods	10003186-1	5804

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Agilent Technologies
Legal Department, 51U-PD
Intellectual Property Administration
P.O. Box 58043
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EXAMINER

FLEMING, FRITZ M

ART UNIT	PAPER NUMBER
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2182

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/853,112

Applicant(s)

WOODS ET AL.

Examiner

Fritz M Fleming

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Fritz M Fleming
FRITZ FLEMING
PRIMARY EXAMINER
GROUP 2100

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 17-23,25-33,35-43 have been considered but are moot in view of the new ground(s) of rejection.

The newly claimed limitations are rejected per the detailed analysis below.

However, it is to be noted that the applicants have disclosed subject matter that would set forth allowable claims if such were to be included in the independent claims. It is clear from applicant's disclosure that in Figure 1, the modules 20,22,23,and 24 module 23 can be located and operated outside of the bay 11 with no change to the underlying communication and time synchronization or methods of coordinating measurements and/or stimuli among the modules 20-24 (see [0023]). Thus if the independent claims were to set forth that each module is plugged in the instrument bay (as now claimed), but each can be removed and located and operated outside of the bay with no change to the underlying communication and time synchronization or methods of coordinating measurements and/or stimuli among the modules, then the claims would define over the art of record. At best, the art of record teaches all of the modules plugged into the bay, or operating independently without a bay, but not that a module can be plugged in and then taken out of the bay, without altering the above mentioned details.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

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application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/21/2005 has been entered.

Drawings

3. The drawings are objected to because Figure 1 does not use "12" to reference the communications device. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 40-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 40-43 are vague and indefinite as each bay has its set of modules and links, but at the end of claim 40, "among the modules" and "via the network communication links" is unclear. It is recommended that "first/second" be used with the modules and links in order to clarify the extent of the communications.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 17-23,25-33,35-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eidson '374 in view of Eidson '753, Read et al. and Husted et al.

Eidson '374 is the primary reference and teaches a majority of the claimed limitations. For example, note a system per Figures 1 and 2. Note a set of modules 18x in the form of instruments and the coordinator 12. Note a communication link 17 in the form of the communications bus so that each module 18x and 12 are capable of communicating on the bus with each other. Per column 5, lines 57-64, the bus 17 can be a GP-IB network, local area network, or other similar communication media. Each module 18x has a clock 22 and means, not shown, as the real time clocks 22 are synchronized using an external timing signal 36 (i.e. a message) per column 5, lines 21-37, via the clock 34 in the coordinator 12, so that, per column 4, lines 11-15, the coordinator can synchronize its internal operation with the remainder of the system and to generate instructions for the instruments 18. Note that the timing signal 36 appears on the same bus 17 as the instrument output signals 32 and the instruction signals 16,

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such that functions such as a voltage measurement or a provided stimulus are coordinated by the synchronized clocks per column 4, lines 16+. While the use of a local area network is explicitly suggested, a set of communications links is not shown, nor is the use of a communications device, nor is the use of an instrument bay. However, note that combination with other references is explicitly taught at column 5, lines 21+, as it is taught that techniques for time synchronization are described in the literature and that "persons ordinarily skilled in the art are capable of using these messages and algorithms to synchronize clocks to a degree of accuracy that is required to practice the present invention" and that "with some minor modifications, the present invention may be practiced on a GP-IB network, local area network, or other similar communication media."

Eidson '753 shows a communications network 16, with a communications device 18, in the form of a smart hub, which can be an ordinary router in an ETHERNET based network. The communications device 18 enables communications between the various modules 14x, especially 12-a and 12-2 per column 3, lines 59/60, over the network 16. Obviously the selection of the smart hub 18 is in response to the physical placement of the modules 14x, as it is the use of the smart hub/router that allows for the connection of the multiple modules 14(1-3) to the network, and for them to communicate with each other per column 3, lines 49-63. Note that a set of links are thus set up via the connections of 14(1-3) to 18 to 16, and it is the use of the smart hub 18, in response to physical placement of the modules 14(1-3) as hubs/routers are used expressly for this purpose of allowing devices at a certain physical location to connect to a network.

Furthermore, the use of a LAN or ETHERNET allows for numerous hubs/routers to be used, as this is the express purpose of LANs and ETHERNETs.

Read et al. teach the final aspect of a LAN interface 16 for the bidirectional communication channel that connects the master control device 12 to slave control devices 14. The master 12 has a clock 18 with master time 22, and each of the slaves 14 has a clock synchronizing means 28 for maintaining the slave time 30, as shown in Figure 3a. Note that each slave 14 has an event controller 34 to record a time coordinated event or cause such to occur per column 4, lines 52+. The synchronization process occurs over the bus 16, per column 6, lines 1+, via the clock set command 50 sent globally to all devices 14 over bus 16. Time stamped messages are issued by devices 14 to the master 12 again via time stamped message 52 over bus 16.

Husted et al. show that it is old and well known in the art to have a modular industrial controller 10 in which functional modules 14 and a local master 24 are housed in a common housing rack 12a with a communications device 16a in the form of a backplane, which is the same thing as a communications bus. Per Figure 2, each module 14 is connected to the bus 16 via a connector 30, so as to provide the module 14 with a power and communications channel to the other modules, such that the bus is also contained in the housing. Thus each module 14 is connected to the communications device 16 via respective network links in the form of the communications channels formed by the connectors 30 to the bus 16. Note each module 14 has a clock 43 which tracks the CST value which is forwarded to the backplane bus 16a by the local master 24, such that the clocks in each module 14 are

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resynchronized. See columns 5 and 6. Per column 9 (lines 1-14), the busses 16 (thus inclusive of 16a) are considered to be a "link", and hence each module is connected to the "link" 16 by the respective "links" 30, such that the local master thus becomes a communications device in the rack 12a, which meets the limitations of an instrument bay. Note that each rack 12a/b of Figure 1 has its own bus 16a/b and that they are interconnected via high speed link 27b, which allows for connection with other modules 14 or remote racks of I/O modules 20 or the like. See column 4, lines 36-62. Also note, that due to the connection to the high speed link 27b, each rack 12a/b has a communications device in the rack, namely the bus and module that interfaces to the link 27b. In other words, rack 12a has a communications device 24a and 16a which allow for network links inside the rack per each clocked module 14 and its connector 30, and the same applies to rack 12b and 24c/d and 16b.

Therefore it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify Eidson '374 per the teachings of Eidson '753 and Read et al. and Husted et al. for the express purposes set forth by Eidson '374, namely being the ability to allow for the use of a local area network (thereby allowing for the use of a communications device such as a router or hub), as well as the ability to synchronize the clocks, and to be able to incorporate the overall system into a rack of Husted et al. to allow for the compact housing of a modular industrial controller, with a communications device housed in the instrumentation bay (or rack). The other claims are set forth as follow:

- Claim 18: smart hub 18.

- Claim 19: a smart hub 18 is also a router in an ETHERNET LAN, and thus a communications repeater.
- Claim 20: a smart hub 18 in the form of a router is a communications switch.
- Claim 21: per the example of Eidson '374, an applied stimulus 31 triggered by a timing signal 23 from the real time clock 22.
- Claim 22: per the example of Eidson '374, a voltage reading is made at 1000, with time signal 27 associated with the measurement 30 and time stamping of an event per Read et al. in 52.
- Claim 23: Eidson '374 per a voltage reading at 1000.
- Claim 25: per Eidson '374, a voltage measurement to be taken at 1000 is sent via an instruction signal 16 from the coordinator 12 via bus 17 and stored in the module 18 buffer 24 and read by circuitry 20.
- Claim 26: per Eidson '374, the same applies to a stimulus 31 applied per the timing signal 23.
- Claim 27: while a time interval is not explicitly set forth, such is obvious subject matter in view of Eidson '374, as measurements are not just limited to a single time instant, as a device under test 28 is usually under test for an extended period of time, thereby necessitating the use of intervals of measurement, as such is a routine matter of testing.
- Claim 28: the same applies to a stimulus applied over a time interval.
- Claim 29: both Eidson '374 and Read et al. and Eidson '753 show the use of the bus to transmit a message containing the measurement data.

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- Claims 30-33 and 35-39 are rendered obvious per the reasons applied to the apparatus above, noting that operations described in the combined references covers such. In order for the apparatus to function, it has to be put together including the selection of the bus and its links, the modules and the smart hubs/routers.
- Claims 40-43 are shown per the combined teachings, especially noting that Husted et al. shows separate racks 12a/b with their own busses 16a/b that allow for intra-rack communications and time synchronization, as well as the connecting of the racks via a high speed bus 27b, such that the modules of rack 12a can communicate with the modules of rack 12b. Thus in combination, time synchronization messages, as well as other communications to include synchronization of functions, are passed along to the racks. The combined teachings set forth different subnets when routers (i.e. the smart hubs of Eidson '573) are used in a larger network to connect the individual racks.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz M Fleming whose telephone number is 571-272-4145. The examiner can normally be reached on M-F, 0600-1500.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Fritz M. Fleming
Primary Examiner
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fmf